Improvement in pain, function and reduction of opioid use with a non-surgical multi-modal approach to atlanto-axial subluxation in an inpatient with osteogenesis imperfecta and rheumatoid arthritis: A case report.

Mary E. Caldwell DO 1; Zachary McCormick, MD3; Karina Bouffard, MD, MPH1

1Department of Physical Medicine & Rehabilitation, Rehabilitation Institute of Chicago / Northwestern University Feinberg School of Medicine

History

66 year old woman with past medical history of osteogenesis imperfecta (OI) and rheumatoid arthritis (RA), who presented with six months of upper neck pain to emergency room. Pain described as mildine, chronic and achy, worse with neck movements, and associated with sharp pain that radiates to behind her left ear with neck movements.

At home, the patient was taking sustained release morphine 30 mg every 8 hours and hydromorphone 10 mg every 6 hours, with recent escalation in hydromorphone use due to progressive neck pain. Per her husband, she has been requiring total assist for all activities and recently very lethargic due to her pain medication intake.

Neurosurgery determined that she was not a candidate for surgical intervention due to no myelopathy or dislocation, and no evidence of myelopathy (See Figures 3 and 4).

At home, the patient was taking sustained release morphine 30 mg every 8 hours and hydromorphone 10 mg every 6 hours, with recent escalation in hydromorphone use due to progressive neck pain. Per her husband, she has been requiring total assist for all activities and recently very lethargic due to her pain medication intake.

Physical Exam

Evaluation notable for rotated left and side-bent right cervical spine. Limited active range of motion due to midline and left sided neck pain that radiated into occiput and behind ear with neck movement as well as temporal region. Pain to touch over the splenius muscles and cervical paraspinals. Strength was 3/5 throughout. No hyper-reflexia and no clonus.

Interventions

Pain consult conducted, soft cervical collar placed due to poor postural mechanics. Diagnosed with Occipital Neuralgia from C2 nerve compression. Initiated pregabalin 75 mg twice a day. Performed left sided greater and lesser occipital nerve blocks (ONB) with 100% relief for 24 hours, followed by 60% pain reduction. Sustained release morphine reduced to 20 mg twice a day and hydromorphone to 8 mg twice a day. After 15 days, discharged with improved lethargy, posture, function, and sustained pain reduction.

Imaging

Figure 1: Lateral Extension Radiograph.

Figure 2: Lateral Flexion Radiograph.

Figure 3: Sagittal T2 weighted MRI of Cervical Spine demonstrating C1 Lateral Mass Edema.

Figure 4: Computed Topography of Cervical Spine, Bone window, demonstrating AAS.

Discussion

- The typical treatment for atlanto-axial (AA) instability or occipitocervical instability associated with pain, progressive neurological deficits, or myelopathy is C1-C2 fixation or occipitocervical fixation(2). However, due to our patient’s OI and no evidence of dislocation or myelopathy, surgery was not a reasonable option and a conservative approach with pain control was recommended.
- Pain, in our patient’s case, may have multiple origins and the differential should include cervicogenic headaches and occipital neuralgia (3). The most accepted mechanism of cervicogenic headaches is referred pain from cervical structures innervated by the upper three cervical spinal nerves (4).
- Given our patient’s symptoms and cervical imaging with edema throughout the upper lateral masses, the likely etiology of her pain was cervicogenic headaches. Decompression of the lateral masses or lateral mass intra-articular steroid injections would be ideal options to provide pain relief (4). However, given our patient’s multiple pathological processes and unclear anatomical landmarks on imaging, there was high risk for complications during and/or from an injection or surgery.
- Therefore, occipital neuralgia from compression of the occipital nerve as it courses over C2 was considered, and a less invasive approach was performed. We targeted the peripheral C2 terminal branches (the greater and lesser occipital nerves) with an occipital nerve block (ONB) and further with oral membrane stabilizers and found success.
- This may suggest that in patients with lateral mass edema, occipital neuralgia may be a large component of the pain, and a less invasive peripheral nerve injection may be an early, safe and successful, short-term option for pain relief (especially if there are contraindications to invasive procedures).

Conclusion

In a patient with RA and OI, with AA subluxation and lateral mass edema, who is unable to undergo surgery or an image guided lateral mass injection, a multi-modal rehabilitation-based pain management approach targeting neuropathic pain via ONB and pregabalin, as well as postural re-training, demonstrated functional and pain improvements.

References